STELLAR PHOTOGRAPH EVIDENCE FOR EINSTEIN'S RELATIVITY THEORY

B. H. CROOKES, writing in *Chemical News*, on the basis of hitherto unpublished experiments by W. G. Crookes, suggests that the displacements of the star images obtained in the 1919 eclipse, and accepted as evidence of the truth of Einstein's theory, may have occurred, not during exposure, but subsequently during development and fixing. That the latter can occur in photographs of spectra of the elements was suspected, tested, and proved by him, the test being made in the following manner: A negative, with two spectra, slightly overlapping, was selected, which had at one part of it a group of strong lines, and at another part few and weak lines. From this negative a contact positive was printed, and from the positive another contact negative. The two negatives were then measured in the usual manner, along the overlap of the two spectra, and compared, and the following results noted: (a) the whole negative altered in length; (b) the alteration took place in a "concertina" fashion, being greater where the lines were strong and numerous than where they were light and few; (c) one or two lines showed decided displacement with regard to their neighbors in the same spectrum. The conclusion drawn was that during development and fixing the sensitive film was in a state of tension, and yielded to the strain irregularly in proportion to the depth and width it had been altered by the light rays. It would then seem that the spectra had been measured along the very worst line, where distortion would be greatest, and arrangements were being made to alter the shuttering of the spectroscope so that the measurements could be taken along a line only just off the unexposed part of the plate, where distortion would be least, but death intervened, and the alteration was never made. In the case of stellar photographs there would appear to be no line of weakness, but in the eclipse the ring of flames would form a very decided line of weakness, and the author suggests the desirability of examining the possibility of the displacements having arisen from the sensitive films having yielded to strain in its neighborhood during developing and fixing. If this should be the case, a similar effect should be found, he suggests, during an annular lunar eclipse, and it might even be possible to obtain evidence of slight displacement during a close conjunction of a star with Jupiter or Venus when at their brightest. Bright star clusters might also show systematic divergencies between the photographic and visual positions.

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Note.—Illustrated articles are marked with an asterisk (*), shorter articles and notes with the letter (n). Look for the general subject rather than the supposed specific title of any article. Thus under the headings "Aeronautics," "Automobiles," "Biology," etc., related articles may be found much more quickly than by referring to the title of the article, which often is not listed indepentently at all.